(***Architectural Historian***—*continued from page 19*)

in his *New England Prospect* that “glasse ought not to be forgotten of any that desire to benefit themselves, or the Countrey: if it be well leaded, and carefully pak’t up, I know of no other commodity better for portage or sayle.”

The existence of architectural features like the Coddington sash in study collections can often provide the physical documentation needed to reproduce missing elements in historic house restorations. Such was the case in 1929 when architect R. Kinnicutt used the Coddington sash as a model in one of his Rhode Island projects. The study drawing shown here is one that he produced on this occasion.

The wood casement window illustrated in the advertisement in figure 2 was manufactured in the 1930s by the Andersen Corporation. The company retains both the advertisement and the actual window in a collection at its headquarters in Bayport, MN. Examination of these materials provides an opportunity to study technological advances in the window industry. Following the introduction of vertically sliding sash in the 18th century, residential casements declined in popularity. In the early-20th century, however, they were revived by manufacturers like Andersen, who updated the old design and produced wood casements, which, unlike the 17th-century ones, were shipped as complete units and came with modern conveniences like interior screens, weatherstripping, removable double glazing, and extension hinges to permit cleaning the outer side of the sash from inside the sash. In addition, under screen sash operators permitted opening and closing of the window just by turning the handle. Anyone viewing this window and accompanying advertising materials can appreciate the technology involved in “modernizing” a centuries-old design.

Fig. 2. Both a sample casement and the original product information are kept in the collection held by the Andersen Corporation. Courtesy, Andersen Corporation.

Now in the Mid-Atlantic Region of the National Park Service, Kathleen Catalano Milley has served during her NPS career as a museum curator, architectural historian, and interpreter.

A Historical Architect

The individual object in a collection often represents a distinct reference point—about the building, carpentry techniques, craft practices of prefabrication and assembly, manufacturing practices, and the way in which the design incorporated performance or stylistic concerns. The information is there but it can only be interpreted if supported by documentation and research, and corroborated by the tangible evidence in existing buildings of the time or by objects found in architectural study collections.

Salvaged Artifacts: The Lessons They Offer

Lee H. Nelson

These six cut-off joists (figure 1) are from the Greater Meeting House in Philadelphia, which was first built in 1755 on Second Street near the waterfront, then was moved to a new location on Twelfth Street in 1812, and then was dismantled and reconstructed at the George School in Bucks County, PA, in 1972. In the last move, the ceiling framing was discarded in favor of an “open” ceiling, and these joist fragments from the 1755 building were rescued and accessioned into the Independence National Historical Park Architectural Study Collection (INHP Acc. No. 2630-25).

It is useful to salvage structural parts of buildings into study collections especially when their context is recorded, as in this instance, with HABS drawings. With such specimens we can learn about the methods used by the carpenters for framing the mortise and tenon joints with different depth joists, some with wooden pins, some without pins, some with double tenons or with single tenons (as seen here), and some (seen here nearest to camera) have a haunch below the tenon. This latter aspect shows that the carpenter understood the possibility that this shallow joist might fail in vertical shear at the tenon, and the haunch provides extra bearing to compensate for the thin tenon.

Very evident in this photo are the Roman numerals used by the carpenters because the entire ceiling framing, together with the roof trusses, was prefabricated on the ground by a group of carpenters, each using their own joint details, and thus the Roman numerals were necessary so that when the prefabricated system was taken apart for reassembly in the ceiling, every one of the pieces would go back into the correct location.

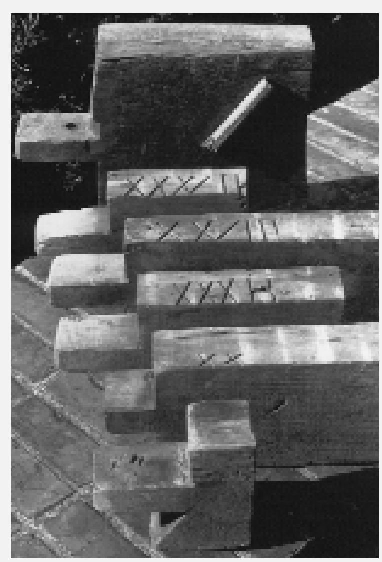

Fig. 1. Structural specimens from a 1755 Quaker Meeting House. Photo by the author.

There is a long history of mortise and tenon construction from the earliest buildings in America; this type of construction continued to be used, for example in barns, until well into the 20th century, even though balloon framing had been in use for decades. There are many differences in structural joinery depending upon the time and place where they were used. Such construction details help us understand building practises, and they also help us understand their structural performance, especially when they have become overloaded or damaged with the intrusion of modern utilities or insects or fungus.

This butt hinge (figure 2) is from the Bishop White House built 1787 in Philadelphia. The Bishop White House hardware is interesting as an example of the “hierarchical quality” approach often used in early buildings. As applied to the Bishop’s house, this approach meant that the best rooms on the first and second floors had dovetail hinges that were set into a mortise in the back edge of the door and held in place with wooden wedges, so that only the knuckles could be seen and thus were “semi-secret,” as opposed to earlier face mounted H and HL hinges. The third floor doors had the then new cast-iron butt hinges and the attic doors had the “old fashioned” HL hinges.

The butt hinge seen here is known to be original to a closet door on the third floor (by virtue of the screw holes), though the door itself had been moved to another location. The hinge was broken and could not be used when the door was to be relocated to its original location. Thus, the wooden pattern (seen here on the right) was made for casting a new hinge to replace this broken original.

Little research has been done on butt hinges, as perhaps they have never captured the interest or imagination of preservation historians. At the time of building the Bishop White House, butt hinges were relatively new, and it is likely that they were part of a hardware order that the Bishop placed with a London merchant. Both the dovetail hinges and the “Cast Butts” were illustrated in an untitled English hardware catalog thought to have been printed in the 1780s. One such catalog reputedly was owned by Benjamin Franklin and which Franklin may have used when his own house was being built on lower Market Street in the late 1780s.

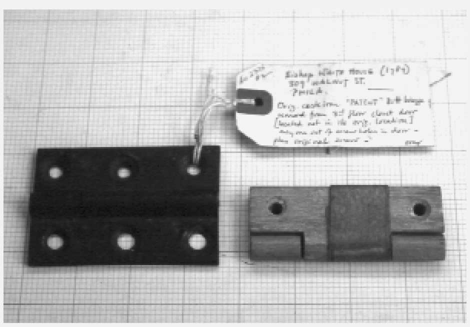

Fig. 2. Cast-iron “PATENT” butt hinge (INHP Acc. No. 2375, no. 2). Photo by the author.

The hinge seen here has the word “PATENT” cast into one of the leaves. We assume that this refers to an English patent, but more research needs to be done on this subject. In fact, many such items of hardware used in early buildings need to have more research done before we will really understand their invention, development, and use in American buildings. Items in architectural study collections are good candidates for research by graduate students in historic preservation. Recommended starting points would be an article by Donald Streeter on the subject of hinges in the *APT Bulletin*, Vol. V, No.1, 1973, pp. 22-49, and a brief essay on early hardware catalogs written by this writer as an introduction to the *Russell and Erwin Hardware Catalog of 1865*, reprinted by the APT in 1980.

Lee H. Nelson, FAIA, who retired from the National Park Service in 1990, is currently completing a project to document stone repair at the White House. He has also been hard at work on a study of early trusses.

An Engineer

Engineers examine, evaluate, and determine the structural integrity of historic structures. Their role is essential and yet they are frequently underrepresented in the preservation community. Objects from architectural study collections provide invaluable information to their ongoing work and, as is true for all people interested in historic structures, offer much from which to learn.

Uses of Structural Artifacts in an Engineering Office

Robert Silman

The standard engineering school curriculum in our colleges does not teach the history and development of structural systems. Engineering schools prefer to concentrate on the current state of the art and what the future will hold. Very few engineers enroll in historic preservation programs or courses. Therefore, the only way in which engineers can learn how to restore and rehabilitate older buildings with a proper sensitivity and respect for the original fabric of the structure is to gain experience on the job.

There is no substitute for going out on a site and observing conditions first-hand. However, we often would like to prepare an untrained engineer for what he or she might expect to encounter at the site. For these purposes, an office archive of photographs and artifacts is invaluable. If the inexperienced engineer can be shown visually what to anticipate, or better yet can touch it, the site visit will be infinitely more meaningful.

Our office has collected structural artifacts from many buildings. These are useful for several reasons:

- They illustrate structural systems no longer in use;
- They demonstrate potential modes of failure;
- They indicate how a repair may be effectively executed.

Our collection includes anchors, fasteners, ties, hangers, connectors, inserts, reinforcing bars, brick, tile, stone, concrete plaster, lath, wood, engineered wood products, adhesives, structural fabric, corroded beams, and columns.

Two examples of the use of the collection will be cited. During the restoration of Carnegie Hall (New York City, 1987) it was determined that much of the structural steel framing (beams and columns) was located too close to the exterior face of the brick facade to provide for proper weather protection. Because the brick had not been pointed for many years and because the joints were open, water had been driven in and caused the steel to corrode. At many locations the outer half of one flange and the entire web was severely corroded while the inner half of the flange was totally intact. In subsequent projects when evidence is present which indicates a similar condition, we use the fragment of beam shown in figure 1 to alert the engineer to a condition which might be encountered. Since most of these conditions are initially concealed and since extensive physical probes destroy too much original fabric, being able to anticipate the condition of corrosion is extremely useful.

A second example which is often encountered deals with buildings constructed of timber floors and brick bearing walls, usually more than 75 years old. We are often asked to evaluate the stability of the brick walls, particularly if the original mortar (often a soft lime mortar) is deteriorated.

(**Engineer**—*continued on page 22*)